AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF PAGES
J	1	2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0002	07 May 2002		

6. ISSUED BY CODE

U.S. ARMY ENGINEER DISTRICT, ALBUQUERQUE
CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, N.E.
ALBUQUERQUE, NEW MEXICO 87109-3435

7. ADMINISTERED BY *(If other than Item 6)* CODE

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

CODE FACILITY CODE

(√) 9A. AMENDMENT OF SOLICITATION NO.

X DACW47-02-B-0011

9B. DATED *(SEE ITEM 11)*
08 April 2002

10A. MODIFICATION OF CONTRACTS/ORDER NO.

10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [ ] is extended, [X] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(√) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

PROJECT: LOMALAND PHASE IV, SOUTHEAST AREA, EL PASO, TEXAS

1. This is Amendment No. 2 to Solicitation No. DACW47-02-B-0011; 08 April 2002. The following revisions shall be incorporated into the specifications and drawings. All other provisions shall remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY *(Signature of Contracting Officer)*	16C. DATE SIGNED

2. SPECIFICATIONS: Delete the following listed pages and substitute the pages attached hereto. On the revised pages, for convenience, changes are emphasized by the amendment number in parentheses before and after changes from the previous issue. All portions of the revised (or new) pages shall apply whether or not changes have been indicated.

Delete Page	Insert Page
00010-4	00010-4
Table of Contents, Page 2	Table of Contents, Page 2
01015-1	01015-1
01200-1 thru 01200-2	01200-1 thru 01200-2
02510-9	02510-9
02510-24	02510-24
02510-50	02510-50
--	02635-1 thru 02635-6
--	02640-1 thru 02640-9

3. DRAWING CHANGES: The following drawings have been revised and the sequence number changed to indicate such revision: RG-ELP-CP-JJ-0.1, RG-ELP-CP-JJ-2.1, RG-ELP-CP-JJ-3.1, RG-ELP-CP-JJ-6.1, RG-ELP-CP-JJ-8.1, RG-ELP-CP-JJ-9.1, RG-ELP-CP-JJ-10.1, RG-ELP-CP-JJ-14.1, RG-ELP-CP-JJ-19.1, RG-ELP-CP-JJ-25.1, RG-ELP-CP-JJ-26.1, RG-ELP-CP-JJ-31.1, RG-ELP-CP-JJ-32.1, RG-ELP-CP-JJ-34.1, RG-ELP-CP-JJ-35.1, RG-ELP-CP-JJ-37.1, RG-ELP-CP-JJ-38.1, RG-ELP-CP-JJ-39.1, RG-ELP-CP-JJ-42.1, RG-ELP-CP-JJ-51.1, RG-ELP-CP-JJ-55.1, RG-ELP-CP-JJ-56.1, RG-ELP-CP-JJ-57.1.

////////LAST ITEM////////

Solicitation No. DACW47-02-B-0011

BIDDING SCHEDULE (Cont'd)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
0012	Baseline "D" 48-Inch RCP Conduit Starting from Sta 3+25.00D to Sta 38+00D, including all Associated Manholes and Bends, 10-Inch Ductile Iron Sewer Transition at Sta 26+83.30D; Pavement Removal, Curb and Gutter Removal, Excavation and Backfill; and Surface Restoration, Complete	Job	Sum	****	$_____
0013 (2)	Carolina Basin - Demolition Work (See PL 3) for Removal of: Concrete Rundowns and Lined Ditch; Intake Structure and Concrete Spillway; Existing Utilities, Removal and Relocations; Chain Link Fencing Removal and Replacement; and Rock Wall Removal and Replacement, Complete	Job	Sum	****	$_____ (2)
0014	Carolina Basin - Outlet Works (See PL 28) including Intake Tower, Gatewell, 48-Inch Steel Lined C.I.P. Conduit; 48-Inch RCP to Sta 3+25.00D; associated Manholes; and Staff Gages, Complete	Job	Sum	****	$_____
0015	Inlet Structure From Baseline "C" Into Carolina Basin From Sta. 27+54.71C to Sta. 29+01.96C, Including Handrail; and Sub Drain System; and Associated Wire Wrapped Riprap, Complete	Job	Sum	****	$_____

DIVISION 2 - SITE WORK (Con.)

SECTION 02330 - EMBANKMENT FOR EARTH DAMS

02379 - STONE PROTECTION

02510 - WATER DISTRIBUTION SYSTEM

02531 - SANITARY SEWERS

02630 - STORM-DRAINAGE SYSTEMS

(2) 02635 - MANHOLE (PRE-CAST)

02640 - PRECAST REINFORCED CONCRETE PIPE (FOR LOW-HEAD HYDROSTATIC PRESSURES OF 125 FT. AND LESS) (2)

02722 - AGGREGATE BASE COURSE

02731 GRAVEL SURFACE COURSE

02741 - HOT-MIX ASPHALT (HMA) FOR ROADS

02748 - BITUMINOUS TACK AND PRIME COATS

02770 - CONCRETE SIDEWALKS AND CURBS AND GUTTERS

02821 - FENCING

02921 - SEEDING

DIVISION 3 - CONCRETE

SECTION 03101 - FORMWORK FOR CONCRETE

03151 - EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS IN CONCRETE FOR CIVIL WORKS

03201 - STEEL BARS AND WELDED WIRE FABRIC FOR CONCRETE REINFORCEMENT FOR CIVIL WORKS

03301 - CAST-IN-PLACE STRUCTURAL CONCRETE FOR CIVIL WORKS

DIVISION 5 - METALS

SECTION 05090 - WELDING, STRUCTURAL

05500 - MISCELLANEOUS METAL

DIVISION 11 - EQUIPMENT

SECTION 11280 - SLUICE GATES

DIVISIONS 13 THRU 16 - NOT USED

Specifications: Lomaland Phase IV, Southeast El Paso, Texas

SECTION 01015

SEQUENCE OF WORK

1. GENERAL REQUIREMENTS:

The work shall be scheduled and performed in sequence to conform to the requirements of the contract documents. The work shall be accomplished in following order of sequence number unless otherwise approved:

Sequence Order No.	Item of Work
1	Mesa Drain to Bobby Grayson Place
2	Bobby Grayson Place to Giles Road
3	Giles Road to Carolina Basin
(2) 4	Carolina Basin and associated inlets (See Note 1 Exceptions to Work Sequence)

Note 1 - Exceptions to Work Sequence. The following features of work may be performed concurrently with other portions of work under any of the sequence nos. 1 through 4: La Paz Inlet, Venado Inlet, Rundown No. 1 inlet and the Baseline "C" concrete stilling basin. (2)

1.1 Construction Constraints

1.1.1 All work in any given work sequence shall be substantially completed to the satisfaction of the Contracting Officer before proceeding to work in the next work sequence unless otherwise approved by the Contracting Officer.

1.1.2 Certain items of work not listed may be performed at other times during the contract period or concurrently with other work as approved by the Contracting Officer.

1.1.3 In general, all work shall progress from downstream to the upstream ends, with the exception of areas that have specific constraints and/or restrictions.

1.1.4 The Contractor shall provide access for traffic in the areas affected by the work. Work shall be coordinated with utility owners, landowners and the Contracting Officer to minimize disruptions.

1.1.5 The sequencing requirements specified herein do not preclude special work requirements or schedule restrictions in any other specifications under this contract.

1.1.6 The Contractor shall notify the Contracting Officer (CO) 15 calendar days prior to the commencement of work in each succeeding area defined above under "Sequence Order No".

Specifications: Lomaland Phase IV, Southeast Area, El Paso, Texas

SECTION 01200

INTERFACE WITH OTHER WORK

1. The Contractor shall make a special effort to fully cooperate with other Contractors, local agencies and Government employees engaged in other work on and adjacent to the work to be performed under this contract. The following work may occur concurrently with the work under this contract:

a. Utility relocations (as specified)

1.1 Utility Relocations by Others. The following utility services, if required to be relocated as a consequence of work under this contract, then this relocation work will be performed by the utility owner: gas, electric, cable and telephone. See drawing Plate 2 for specific coordination and notice requirements. All costs for such relocation for materials and labor only will be the responsibility of the utility line owner. Final restoration of surfaces affected by such utility relocations occurring within the construction limits of this project shall be performed by the Contractor and costs thereto shall be included in the various contract line items of the Schedule.

1.2 The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor.

1.3 Any damage resulting from the use of facilities of other Contractors shall immediately be repaired to the satisfaction of or as directed by the Contracting Officer. The Contractor shall be liable for any costs incurred by the Government including those associated with settlement of disputes or claims by others due to or arising from the failure of the Contractor to comply with this provision.

1.4 Related Section: Refer to section 01510 UTILITIES for coordination requirements pertaining to work in the vicinity of any existing utilities systems.

(2) 1.5 Construction Activity Advisement Notifications

The Contractor shall provide the City of El Paso with written advisements of future construction activity for each phase of work, describing the work to be performed and location, including blocks or streets adjacent to or affected by the work, construction periods, possible impacts, and detour routes. Initial notice of construction work shall be provided at least 30 calendar days prior to start of any activity. Subsequent notices shall be provided for each new area of activity in advance of the work as required to allow for public notices to be issued by the City of El Paso.

1.6 Submittals

1.6.1 Interface Plan. The Contractor shall submit to the Contracting Officer's representative for approval, no later than thirty calendar days, after receipt of the Notice to Proceed, an Interface Plan. This plan shall include, but not be limited to the following: notifications to utility owners, protection and identification of existing utilities, intended staging area for use by other contractors performing work associated with completion of this project, parking area for company and privately owned vehicles; provisions for work by others on or adjacent to Contractor operations by others, and any other items as requested by Contracting Officer.

1.6.2 Construction Activity Advisement Notices. The Contractor shall submit a copy of each advisement notice prepared for the City of El Paso concurrently to the Contracting Officer. (2)

2. PAYMENT. No separate payment will be made for the work covered under this section, and all costs in connection therewith will be considered as a subsidiary obligation of the Contractor.

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a. Pipe Less Than 4 inch Diameter:

(1) Screw-Joint: Pipe shall conform to dimensional requirements of ASTM D 1785 Schedule 80, with joints meeting requirements of 150 psi working pressure, 200 psi hydrostatic test pressure, unless otherwise shown or specified. Pipe couplings when used, shall be tested as required by ASTM D 2464.

(2) Elastomeric-Gasket Joint: Pipe shall conform to dimensional requirements of ASTM D 1785 Schedule 40, with joints meeting the requirements of 150 psi working pressure, 200 psi hydrostatic test pressure, unless otherwise shown or specified, or it may be pipe conforming to requirements of ASTM D 2241, elastomeric joint, with the following applications:

(2)

SDR	Maximum Working Pressure psi	Minimum Hydrostatic Pressure psi
17	150	200
13.5	200	266

(2)

(3) Solvent Cement Joint: Pipe shall conform to dimensional requirements of ASTM D 1785 or ASTM D 2241 with joints meeting the requirements of 150 psi working pressure and 200 psi hydrostatic test pressure.

b. Pipe 4 through 12 inch Diameter: Pipe shall meet the requirements of AWWA C-900 for 4-inch through 12-inch sizes, and AWWA C-905 for 14-inch through 36-inch pipe. Pipe shall be Underwriters Laboratories (UL) approved. All PVC pressure pipe shall be furnished in cast iron pipe equivalent outside diameters and a standard laying length of 20 feet. Minimum pressure class shall be 150 (DR 18) for 4-inch through 12-inch diameters, and 200 psi (DR 21) for 14-inch through 16-inch pipe.

2.1.2 Reinforced Plastic Mortar Pressure (RPMP) Pipe

AWWA C950.

2.1.3 Reinforced Thermosetting Resin Pipe (RTRP)

Pipe shall have a quick-burst strength greater than or equal to four times the normal working pressure of the pipe. The quick-burst strength test shall conform to the requirements of ASTM D 1599.

2.1.3.1 RTRP-I

RTRP-I shall conform to ASTM D 2996, except pipe shall have an outside diameter equal to cast iron outside diameter or standard weight steel pipe. The pipe shall be suitable for a normal working pressure of 150 psi at 73

Protective Coating: An epoxy coating shall be applied to all stationary interior ferrous surfaces including all interior openings in the valves body. The coating shall not be applied to the gasket surfaces of the end flanges. The coating shall be applied in accordance with AWWA C-550 and the manufacturer's instructions.

Valve Exterior: Shall be painted with Red Oxide Phenolic Primer Paint as accepted by the FDA for use on materials in contact with potable water.

2.4.2.4 Pressure Reducing Valves

Shall maintain a constant downstream pressure regardless of varying inlet pressure. Unless otherwise specified, Water Pressure Reducing Valve shall be a direct acting, spring loaded, normally open globe pattern valve designed to permit flow when controlled pressure is less than the spring setting.

2-inches and Smaller: Shall be bronze body, nylon reinforced diaphragm, single seat, composition disc, Watt No. 223 or Masoneilan No. 227, or equal.

Larger than 2-inches: Shall have a cast iron body (conforming to ASTM B-61), bronze main valve trim (conforming to ASTM B-61), a reinforce neoprene diaphragm, stainless steel stem and flanged ends.

Acceptable Manufacturers and Models: Shall be Cla-Val Co., Model 90, Fisher Governor Co., Type 616 Bailey Model 30A, or approved equal.

(2) Pressure Rating: Shall be 150 psi with an adjustment range of 30-300 psi. (2)

Valve Components: Shall be removable and repairable while the valve body remains in the line.

Diaphragm Assembly: Shall be synthetic rubber with a stem fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. The diaphragm shall not be used as a seating surface.

Resilient Disc: Shall form a sealed chamber against the disc seat when the valve is closed. The seat shall be removable and shall have a smooth surface that will not induce seal cutting or wear.

Strainer: Valves 3 inches and smaller shall have a standard flow clean strainer mounted in the inlet supply port of the main valve.

Valves 4 inches and larger shall have a standard y-strainer externally mounted for the protection of the control circuit.

Protective Coating: An epoxy coating shall be applied to all interior and exterior ferrous surfaces of the valve body. The coating shall be applied in accordance with AWWA C-550 Standards.

3.2.1 Pressure Test

Contractor shall provide tapping valves and service stops as needed to ensure 100 percent hydrostatic testing for all installed waterlines and at tie-ins into the existing lines. After the pipe is laid, the joints completed, fire hydrants permanently installed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of piping shall, unless otherwise specified, be subjected for 2 hours (2) to a hydrostatic pressure test of 200 psi.

Each valve shall be opened and closed several times during the test. (2) Exposed pipe, joints, fittings, hydrants, and valves shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, hydrants and valves discovered in consequence of this pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory. The requirement for the joints to remain exposed for the hydrostatic tests may be waived by the Contracting Officer when one or more of the following conditions is encountered:

a. Wet or unstable soil conditions in the trench.

b. Compliance would require maintaining barricades and walkways around and across an open trench in a heavily used area that would require continuous surveillance to assure safe conditions.

c. Maintaining the trench in an open condition would delay completion of the project.

The Contractor may request a waiver, setting forth in writing the reasons for the request and stating the alternative procedure proposed to comply with the required hydrostatic tests. Backfill placed prior to the tests shall be placed in accordance with the requirements of Section 02316 - EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.2.2 Leakage Test

Leakage test shall be conducted after the pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours, and during the test the water line shall be subjected to not less (2) than 200 psi pressure or at the pressure rating of the pipe. Leakage is (2) defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section thereof, necessary to maintain pressure within 5 psi of the specified leakage test pressure after the pipe has been filled with water and the air expelled. Piping installation will not be accepted if leakage exceeds the allowable leakage which is determined by the following formula:

L = 0.0001351ND(P raised to 0.5 power) L=SxDx(P raised to 0.5 power)/133,200

L = Allowable leakage in gallons per hour
N = Number of joints in the length of pipeline tested

Specifications: Lomaland Phase IV, Southeast Area, El Paso, Texas

SECTION 02635 - MANHOLE (PRECAST)

PART 1 - GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 82	(1990a) Steel Wire, Plain, for Concrete Reinforcement
ASTM A 185	(1990a) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 615	(1993) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C 33	(1990) Concrete Aggregates
ASTM C 94	(1990) Ready-Mixed Concrete
ASTM C 144	(1993) Aggregate for Masonry Mortar
ASTM C 150	(1989) Portland Cement
ASTM C 260	(1986) Air-Entraining Admixtures for Concrete
ASTM C 270	(1989) Mortar for Unit Masonry
ASTM C 309	(1993) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 361	(1995) Reinforced Concrete Low-Head Pressure Pipe
ASTM C 478	(1990b) Precast Reinforced Concrete Manhole Sections
ASTM C 923	(1989) Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM C 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))

1.2 GENERAL REQUIREMENTS

Precast manhole shall be low-head hydrostatic pressure pipe, constructed at the location designated, and in accordance with utility standard details, and as otherwise indicated. The manhole shall be constructed of pre-cast concrete sections, as herein specified. The Contractor shall replace damaged material and correct unacceptable work at no additional cost to the Government. Excavation and backfilling is specified in Section 02317 - EXCAVATION, FILLING, AND BACKFILLING FOR CONCRETE STRUCTURES. Backfilling shall be accomplished after inspection by the Contracting Officer. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 - SUBMITTAL PROCEDURES:

SD-01 Data

Manufacturer's Data; GA.

Compliance with ASTM C 478 and these specifications shall be submitted. Manufacturer's specification data and recommendations shall be submitted for the lifters and joint material. Data shall include standard catalog sheets and instructions and all structural calculations used to develop the pre-cast manhole design.

SD-04 Drawings

Manhole Sections; GA.

Complete manufacturer's shop drawings on the manhole section(s), to include the joints, shall be submitted for approval. If the shop drawings do not meet specifications and secure the El Paso Water Utilities Engineer's approval and the Albuquerque District Corps of Engineers approval, the vendor shall revise their shop drawings to meet specifications and receive Engineer's approval.

SD-09 Reports

Test Reports; FIO.

SD-13 Certificates

Portland Cement; FIO.

Certificates of compliance stating the type of cement used in manufacture of precast manholes.

Note: Failure to provide either the detailed shop drawings, calculations, specification data and recommendation on lifters and joint material, or the letter certifying that all material provided shall meet contract specifications shall be grounds for rejection of the material.

PART 2 - PRODUCTS

2.1 FRAMES AND COVERS

Pressure type round manhole frame with bolted lid, watertight heavy-duty construction. Type R-6461-HH by Neenah Foundry or approved equal.

2.2 LADDERS FOR MANHOLES

Ladders for manholes shall be of steel, straight-type, not less than 16 inches in width with 7/8-inch diameter rungs spaced 12 inches on center. Rails shall be not less than 2 inches by 1/2 inch in section. Ladders shall be supported by steel inserts spaced not more than 6 feet apart vertically and so installed to provide at least 6-1/2 inches of toe space between the wall and inside of the rungs. The ladder and inserts shall be galvanized after fabrication in conformance with ASTM A 123.

2.3 MATERIALS

Except as otherwise specified, material used for concrete production shall conform to Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE FOR CIVIL WORKS.

2.4 CONCRETE AGGREGATES

Concretes aggregates shall conform to ASTM C 33 except that the requirements for gradation shall not apply to concrete manholes conical and riser sections.

2.5 STEEL REINFORCEMENT

Billet-steel bars shall conform to ASTM A 615 and welded wire fabric shall conform to ASTM A 82 or ASTM A 185.

2.6 CEMENT MORTAR

Cement mortar shall composed of 1 part Portland Cement Type V and 3 parts mortar sand mixed in an approved manner with water to form a workable mixture. Mortar sand shall conform to ASTM C 144. Water shall be clean, free from oil, acid or organic matter and injurious amounts of alkali, salts or other chemicals or deleterious materials.

2.6.1 Portland Cement

Portland cement shall conform to ASTM C 150, Type V for concrete used in manholes and thrust blocking. Air-entraining admixture conforming to ASTM C 260 shall be used with Type V cement. Where aggregates are alkali reactive, as determined by Appendix XI of ASTM C 33, a cement containing less than 0.60 percent alkalies shall be used.

2.6.2 Portland Cement Concrete

Portland cement concrete shall conform to ASTM C 94, compressive strength of 4000 psi at 28 days. Concrete in place shall be protected from freezing and moisture loss for 7 days.

2.7 STRUCTURES

2.7.1 Precast Reinforced Concrete Manhole Sections

Precast reinforced concrete manhole sections shall conform to ASTM C 478, except that portland cement shall be as specified herein. Pre-cast reinforced concrete manhole section, gaskets and seals shall also meet the external and internal pressure requirements of ASTM C 361, Class B-50. The manhole riser and conical section shall be designed for water and sewer installations in the diameters specified or as shown. All manhole sections shall have tongue and groove joints. Rings shall be available in various lengths from one foot to four feet. The base ring shall have a flat bottom joint. Joints shall be cement mortar, or an approved mastic or rubber gasket, or an approved combination of these types.

PART 3 - EXECUTION

3.1 MANHOLES

3.1.1 Placing

All concrete shall be handled in the same manner as specified in section 02640: PRECAST REINFORCED CONCRETE PIPE (FOR LOW-HEAD HYDROSTATIC PRESSURES OF 125 FT. AND LESS).

3.1.2 Curing

For purposes of early re-use of forms, the concrete may be heated in the mold after the initial set has taken place. The temperature shall not exceed 160 degrees and shall be raised from normal ambient temperature at a rate not to exceed 40 degrees per hour. The cured unit shall not be removed from forms until sufficient strength is obtained for the unit to withstand any structural strain that may be subjected during the form stripping operation. After the stripping of forms, further curing by means of water spraying or a membrane curing compound may be used and shall be of a clear or white type, conforming to ASTM C 309.

3.1.3 Steel Reinforcement

Reinforcing steel shall be as outlined in ASTM C 478 and any additional specifications herein. The minimum steel area of 0.12 square inches shall apply to both risers and cone sections and the maximum center to center spacing of 6 inches shall apply as well. Placing of reinforcing steel for one line circumferential reinforcement shall be on the tension side of the wall (the inner half part of the wall with a minimum 1-inch cover) for two lines circular reinforcement, refer to ASTM C 478. All reinforcing shall be sufficiently tied to withstand any displacement during the pouring operation. Pre-cast RCP manhole sections with the reinforcing showing on the inside face of the manhole sections will be rejected and not allowed for use on this project.

3.1.4 Joints

Joints shall comply with the requirements of ASTM C 361.

3.1.5 Lifters

Lifters shall be designed to handle the imposed weights, and shall be placed per manufacturer's requirements.

3.1.6 Joint Material

Joint material shall comply wit the requirements of ASTM C 361.

3.2 INSTALLATION

The manhole shall be installed at the location shown on the plans or as directed by the Contracting Officer in accordance with the details shown on the plans and as specified herein. After the excavation has been completed, the concrete base and subsequent riser sections shall be installed as per the manufacture’s recommendations.

a. The subgrade under pre-cast manhole bases shall be compacted to 95% density in accordance with ASTM D 1557. Compaction limits shall be one foot beyond the perimeter of the concrete base and shall be a minimum of one foot in depth.

b. All manholes that are in ground water shall be externally coated with a bituminous coating such as Coal Tar Epoxy or Chevron Industrial Membrane, or approved equal. Interior coating of manholes shall be required only when specified in the construction plans. The coating shall be an epoxy resin-type material such as Plascite 7122 or approved equal.

3.3 QUALITY CONTROL

3.3.1 General

The Contractor shall establish and maintain quality control for the work covered in this section of the Technical Provisions to assure compliance with

contract requirements and maintain quality control records for all construction operations, including but not limited to the following:

(1) Installation of manholes.

3.3.2 Records

Two legible copies of these records, as well as the records of corrective action taken, shall be furnished to the Government as directed by the Contracting Officer.

3.4 PAYMENT

Payment for work covered under this section will be included in the item to which the work applies.

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Specifications: Lomaland Phase IV, Southeast Area, El Paso, Texas

SECTION 02640

PRECAST REINFORCED CONCRETE PIPE
(FOR LOW-HEAD HYDROSTATIC PRESSURES OF 125 FT. AND LESS)

1.1 APPLICABLE PUBLICATIONS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

FEDERAL STANDARD (FED-STD)

FED-STD No. 601	Rubber: Sampling and Testing. (Incl.& Change Notices 1 through 7.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) Publication.

AASHTO M 198	(1998) Joints for Circular Concrete Sewer and Culvert Pipe, Using Flexible Watertight Gaskets.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) PUBLICATIONS.

ASTM C 33	(1999ae1) Concrete Aggregates.
ASTM C 270	(1997) Mortar for Unit Masonry.
ASTM C 361	(1997) Reinforced Concrete Low-Head Pressure Pipe.
ASTM C 443	(1994) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
ASTM D 422	(1963, R 1998) Particle Size Analysis of Soils
ASTM D 1556	(1990, R1996e1) Density of Soil in Pace by the Sand Cone Method.
ASTM D 1557	(1991, R1998)Moisture-Density Relations of Soils and (R 1990) Soil Aggregate mixtures Using 10-lbs (4.54 Kg) Rammer and 18-in. (457-mm) Drop.

ASTM D 2922	(1996e1) Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth).
ASTM D 3017	(1988, R1996e1) Water Content of Soil and Rock In Place by Nuclear Methods (Shallow Depth).

1.2 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

1.2.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with the minimum of handling. Do not store materials directly on the ground. Inside of pipes and fittings shall be kept free of dirt and debris.

1.2.2 Handling

Materials shall be handled in such a manner as to insure delivery to the trench in sound undamaged condition. Pipe shall be carried to the trench not dragged. Gasket materials and plastic materials that are not to be installed immediately shall not be stored in the direct sunlight.

1.3 SUBMITTALS

1.3.1 Manufacturer's Recommendations for Non-Government Supplied Pipe

Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contracting Officer prior to installation. Installation of the item will not be allowed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.3.2 Layout of Pipe Conduits and Special Details for Non-Government Supplied Pipe

Prior to commencement of work on pipe conduits, the Contractor shall submit to the Contracting Officer, for approval, a layout of the pipe conduits. Along with the above-required layout, the Contractor shall also submit to the Contracting Officer, for approval, details of the installation the Contractor proposes to use in the areas where the pipe conduit alignment curves.

1.3.3 Modified or Special Designs for Non-Government Supplied Pipe

Where a modified or special design is required to meet the specification requirements for any class of pipe, the Contractor shall submit proof of the adequacy of the modified or special design as specified in ASTM C 361.

1.4 TESTS FOR PIPE

1.4.1 For non-government supplied pipe ASTM C 361 Class B50 Pipe

Certified copies of test reports demonstrating conformance to applicable pipe specifications shall be delivered to the Contracting Officer before pipe is installed. Strength tests for concrete as required in applicable specifications shall be the three-edge bearing tests. The Contractor shall furnish certification of compliance with the requirements of subparagraph 3.9.3 of this Section.

PART 2 PRODUCTS

2.1 PIPE

Pipe shall conform to ASTM C 361.

2.2 MORTAR

Mortar for connections to drainage structures shall conform to ASTM C 270, Type M, except the maximum placement time shall be 1 hour.

2.2.1 Cement and Sand

Cement and sand shall be as specified for concrete in Section 03301: CAST-IN-PLACE STRUCTURAL CONCRETE FOR CIVIL WORKS.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CONDUITS

3.1.1 General

All excavation will be considered as unclassified. Removal and replacement of pavement shall be in accordance with SECTION 02220: DEMOLITION, Paragraph: PAVEMENTS. Excavation shall consist of removal of material in preparing for foundations for pipe to the lines and grades shown on the drawings and to remove objectionable materials. Care shall be exercised by the Contractor not to excavate below the grades shown on the drawings and any excessive excavation, as determined by the Contracting Officer, due to the fault or negligence of the Contractor, shall be backfilled to grade with suitable earth thoroughly compacted, all by and at the expense of the Contractor. Excavation for piping shall be by vertical wall trenching or excavation to the limits shown on the drawings. Sheeting and bracing shall be placed within the trench width of vertical walls as required by the Corps of Engineers Safety Manual. Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with bedding material, compacted as provided in paragraph "BACKFILLING." When

removal of unstable material is due to the fault or neglect of the Contractor in his performance of shoring and sheeting, water removal, or other specified requirements, resulting material shall be excavated and replaced by the Contractor at no additional expense to the Government.

3.1.2 Disposition of Excavated Material

Excavated materials which, in the opinion of the Contracting Officer, are suitable for incorporation in the trench backfill shall be placed directly therein. Materials which are unsuitable as foundation or fill material, in the opinion of the Contracting Officer, will be ordered wasted. Such material shall become the property of the Contractor, shall be removed from the work site, and shall be disposed of in areas approved by city, county and state authorities for the material involved. The material shall be disposed of in compliance with all applicable city, county, state and Federal laws and regulations governing the material involved.

3.2 BEDDING FOR PIPE

Bedding for Pipe shall be Class B bedding. Bedding shall be prepared and installed in accordance with good practice and recommended procedures approved by the Contracting Officer. Bedding material shall be the fine aggregate specified for concrete as per ASTM C 33 and the installation shall consist of a shaped subgrade with a 2-inch bedding layer carefully shaped with a template to fit the bottom of the pipe and to conform with dimensions shown on the drawings.

3.3 PLACING PIPE

Each pipe shall be carefully examined before being laid, and defective or damaged pipe shall not be used. Pipelines shall be laid to the grades and alignment indicated and shall not deviate more than 3-inches. Proper facilities shall be provided for lowering sections of pipe into trenches. Alignment shall be by means of a laser device and alignment shall be checked at least every 8 feet. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. All pipe in place shall have been inspected before backfilling and those pipes damaged during placement shall be removed and replaced at no additional cost to the Government. Concrete pipe laying shall proceed upgrade with the tongue ends pointing in the direction of flow.

(a) Circular concrete pipe with elliptical reinforcing shall be so placed that the reference lines designating the top of the pipes will be not more than 5 degrees from the vertical plane through the longitudinal axis of the pipe. In all backfilling operations care shall be taken to prevent damage to or misalignment of the pipe.

3.4 JOINTING

Joints for ASTM C 361 concrete pipe shall conform to ASTM C 443 or AASHTO M198. O-Ring Gasket type joints shall conform to the requirements of subparagraph: O-Ring Gasket Joints.

3.4.1 O-Ring Gasket Joints

3.4.1.1 Materials

O-Ring gasket joints shall be made with rubber-type gaskets. The design of joints and the physical requirements for rubber-type gaskets shall conform to ASTM C 443. Gaskets shall have not more than one factory-fabricated splice, except that two factory-fabricated splices of the rubber gasket type are permitted if nominal diameter of pipe being gasketed exceeds 54-inches.

3.4.1.2 Test Requirements for Non-Government Supplied Pipe

Gaskets or jointing materials shall not swell more than 100 percent by volume when immersed in accordance with Method 6211 of Fed. Std. 601, in immersion medium No. 3 for 70 hours at 212°F. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed.

3.4.1.3 Installation of Joints

Gaskets and jointing materials shall be as recommended by the particular manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements and shall conform to the requirements of ASTM C 361. Surfaces to receive lubricants, cements, or adhesives shall be clean and dry. Gaskets and jointing materials shall be affixed to the pipe not more than 24 hours prior to the installation of the pipe and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials shall be inspected before installing the pipe; any loose or improperly affixed gaskets and jointing materials shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pulled together. If, while making the joint, the gasket or jointing material becomes loose and can be seen through the exterior joint recess when joint is pulled up within on inch of closure, the pipe shall be removed and the joint remade.

3.4.2 Diaper Bands

(a) Diaper bands shall be used if gasketed joint fails or if the joint is not within the manufacturers specifications. Diaper bands shall consist of heavy cloth fabric to hold mortar in place at joints and shall be cut into such lengths that they will extend one-eighth of the circumference of pipe above the spring line on one side of the pipe and up to the spring line on the other side of the pipe. Longitudinal edges of fabric bands shall be rolled and stitched around two pieces of wire. Width of fabric

bands shall be such that after fabric has been securely stitched around both edges on wires, the wires will be uniformly spaced not less than 8 inches apart. Wires shall be cut into lengths to pass around pipe with sufficient extra length for the ends to be twisted at top of pipe to hold band securely in place; bands shall be accurately centered around lower portion of joint.

(b) Mortar shall be poured between band and pipe from only the high side of band, until mortar rises to the top of band at the spring line of pipe, or as nearly so as possible, on the opposite side of pipe, to insure a thorough sealing of joint around the portion of pipe covered by band. Silt, slush, water, or polluted mortar forced up on the lower side shall be carefully forced out by the pouring and removed.

(c) The remaining unfilled upper portion of the joint shall then be filled with mortar and a bead formed around outside of this upper portion of joint with sufficient amount of additional mortar. The diaper shall be left in place. No backfilling around joints shall be done until joints have been fully inspected and approved. The cement mortar, finish, and preparation of joints shall be as specified in paragraph: 3.6 MORTAR.

3.5 PIPE BENDS AND/OR TURNS

Pipe bends and/or turns shall be made by joint deflections, beveled ends or by shop fabricated elbows. Joint deflections shall not exceed 0-degrees, 15-minutes and beveled ends shall not exceed 2-degrees, 30-minutes or as recommended by the pipe manufacturer. Elbow deflections shall conform to manufacturer's requirements.

3.6 MORTAR

3.6.1 Quantity of Water

The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar but in no case shall exceed 4.5 gallons of water per sack of cement. Water shall be clean and free of harmful acids, alkalies, and organic impurities.

3.6.2 Usability

The mortar shall be used within 30 minutes after the ingredients are mixed with water.

3.6.3 Joint Preparation

The inside of the joint shall be wiped clean and finished smooth. In pipe too small for a man to work inside, wiping may be done by dragging a suitable swab or long-handled brush through the pipe as work progresses. The mortar bead on the outside shall be protected from air and sun with a proper covering until satisfactorily cured.

3.7 CONDUIT CLOSURES

The Contractor shall make closures at cast in place junction structures or at other approved locations as detailed on the drawings.

3.8 MANHOLES

Manholes shall conform to Section 02635 MANHOLE (PRECAST).

3.9 BACKFILLING

3.9.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, material from required excavation, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6-inches in compacted depth. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. Care shall be taken to insure thorough compaction of the fill under the haunches of pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation of at least 12 inches above the top of the pipe. The remainder of the trench to 24-inches above the top of the pipe shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding 8-inches. Tests for density will be made as necessary to insure conformance to the compaction requirements specified elsewhere in this paragraph. Where it is necessary in the opinion of the Contracting Officer, any sheeting or portions of bracing used shall be left in place and the contract will be adjusted accordingly.

3.9.2 Movement of Construction Machinery

In compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction shall be at the Contractor's risk. Any pipe damaged thereby shall be repaired or replaced.

3.9.3 Compaction

3.9.3.1 General

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.9.3.2 Minimum Density

Backfill over and around the pipe shall be compacted at the approved moisture content. Density shall not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.

3.9.4 Testing of Backfill Materials

Characteristics of backfill materials shall be determined in accordance with particle size analysis of soils ASTM D 422 and moisture-density relations of soils ASTM D 1557. A minimum of one particle size analysis and one moisture-density relation test shall be performed on each different type of material used for bedding and backfill.

3.9.5 Determination of Density

Testing shall be the responsibility of the Contractor and performed at no additional cost to the Government. Testing shall be performed by a government approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to insure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D 1557 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. A minimum of one field density test per lift of backfill for every 500 feet of installation shall be performed. One moisture density relationship shall be determined for every 1500 cubic yards of material used. Field in-place density shall be determined in accordance with ASTM D 1556 or ASTM D 2922, Method B, or as specified for fills in SECTION 02317: EXCAVATION, FILLING, AND BACKFILLING FOR CONCRETE STRUCTURES. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using the sand cone method as described in paragraph "Calibration" of the ASTM publication. ASTM D 2922 results in a wet unit weight of soil and when using either of these methods, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job, on each different type of material encountered, and at intervals as directed by the Contracting Officer. In addition, if ASTM D 2922 is used, in place densities as specified in ASTM D 1556, shall be taken as a check, every fourth test performed by the nuclear method. Copies of calibration curves, results of calibration tests, and field and laboratory density tests shall be furnished to the Contracting Officer within 24 hours of conclusion of the tests. Trenches improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified at no additional cost to the Government.

3.10 QUALITY CONTROL

3.10.1 General

The Contractor shall establish and maintain quality control for the work covered in this section of the Technical Provisions to assure compliance with contract requirements and maintain quality control records for all construction operations, including but not limited to the following:

(1) Pipe

(2) Excavation of materials

(3) Use of and disposal of excavated materials

(4) Dewatering

(5) Bedding, placing and jointing the pipe

(6) Backfill and compaction

(7) Lines and grades

(8) Pipeline testing

3.10.2 Records

Two legible copies of these records, as well as the records of corrective action taken, shall be furnished the Government as directed by the Contracting Officer.

3.10.3 Plant Inspections

In addition to the above general quality control requirements, the Contractor shall inspect concrete pipe casting operations at the pipe manufacturer's plant at the beginning of casting, at least once a week during casting, and during fabrication of elbows. During these inspections, the Contractor shall give particular attention to verifying that interior cover over reinforcing steel conforms to ASTM C 361. Any RCP units brought to the job-site with the reinforcing showing on the inside face of the pipe will be rejected and not allowed for use on the project.

PART 4 MEASUREMENT AND PAYMENT

No separate payment will be made for the work covered under this section and all costs in connection therewith shall be included in the lump sum prices on the SCHEDULE for the line items to which the work pertains.

- END OF SECTION -